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ABSTRACT

Low scores on the Iowa Test of Basic Skills Mathematics Sub-Test went up considerably among students who made daily use of Computer-Assisted Instruction (CAI) at the Log Cabin Elementary School in Jackson County, North Carolina. Students who were in the lower 45% of a class in mathematics achievement were scheduled for daily ten-minute exposure to CAI, while the upper 55% of the pupils were given a ten-minute period with the computer once a week. The analysis shows that students in the lower 45% who participated daily, had greater gains than those who participated only once a week. The CAI program is credited with raising all mathematics scores, and is thought to account for the differences in amount of student improvement between the two pupil groups. (MP)

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COMPUTER-ASSISTED INSTRUCTION CREDITED WITH RAISING LOW MATH SCORES

by Dr. Clarence DelForge
Alfred E. Bloeser

Low Iowa Test of Basic Skills, Math Sub-Test scores were considerably raised through daily use of Computer-Assisted Instruction by students of the Log Cabin Elementary School in Jackson County, North Carolina. The students who were in the lower 45 percent of the class in math achievement had greater gains than those in the upper 55 percent. These gains were attributed to Computer-Assisted Instruction (C.A.I.) during the academic school year, 1976-77.

Students at the Log Cabin Elementary School, historically have had low math scores. Jackson County, the Teacher Corps and the Elementary Education Department of Western Carolina University were concerned and determined to find a way to meet the needs of these children.

In the late fall of 1976 a computer terminal was installed in the open classroom of the fourth, fifth and sixth grades, at Log Cabin School. Through the facilities of the Research Triangle Park, the Hewlett-Packard Math Program was introduced. Students who had evidenced low scores in math on the Iowa Test of Basic Skills, Math Sub-Test were scheduled for a daily ten minute period with the computer. The upper 55 percent of the students were scheduled for a ten minute period once a week.

The program was received with great enthusiasm by both students and teachers. Even though the school was closed for more than a month because of bad winter weather, their interest was maintained throughout the school year.

An analysis of the results of the program discloses that the lower 45 percent of the three classes, who were scheduled for daily exposure to Computer-Assisted Instruction, raised its scores appreciably more than did those who participated only once a week. Twenty-six students who formed the lower 45

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percent of the classes gained one year and nine months in the Hewlett-Packard Math Program, and one year and one month on the Iowa Test of Basic Skills, Math Sub-Test. The upper level group of thirty-two students (55 percent), who spent only ten minutes a week with the computer, raised their scores seven months in the Hewlett-Packard Program and eight months on the Iowa Test of Basic Skills, Math Sub-Test.

(Figure 1.)

Math Achievement for 1976-77

Group	Mean Computer Progress	Mean Periods	Mean Hours	Mean Iowa Test of Basic Skills, Math Sub-Test Progress
Lower 45% of students in classes*	1 yr. 9 mos.	84	14 hours	1 yr. 1 mo.
Upper 55% of students in classes**	7 mos.	27	4 hrs. 30 min.	8 mos.

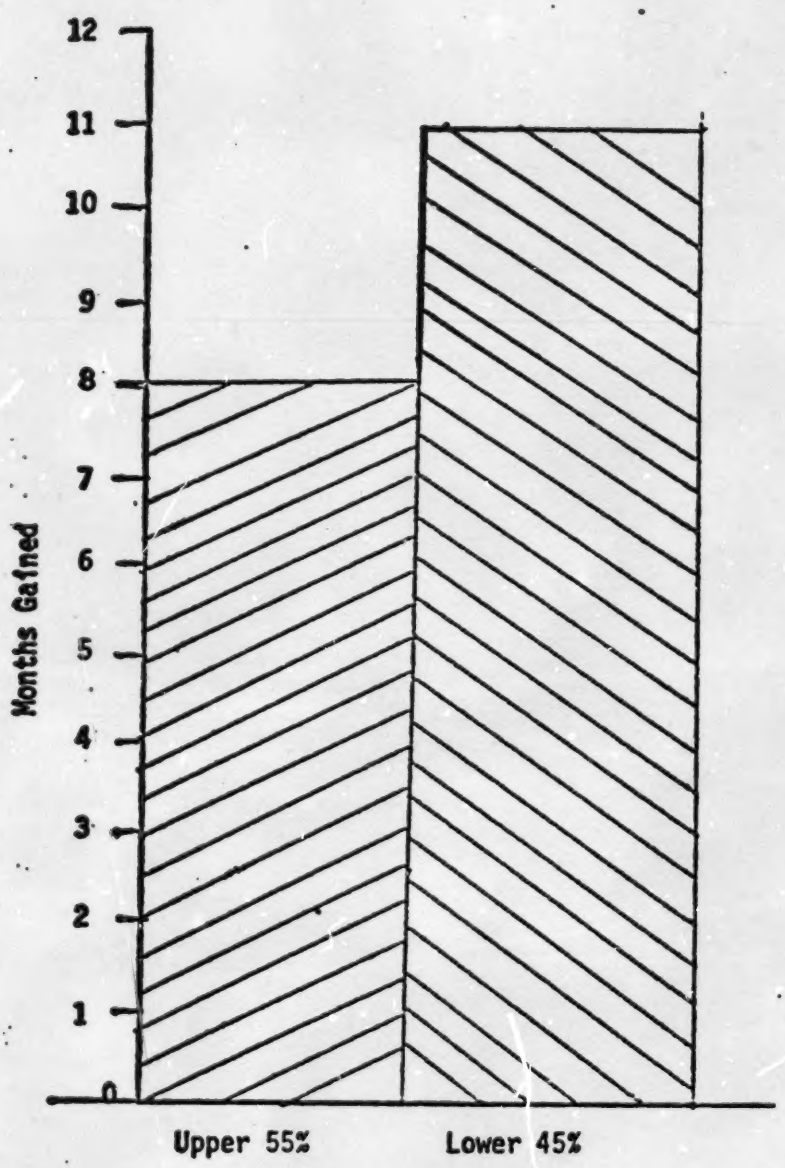
* 26 students in the fourth, fifth, and sixth grade classes.
**32 students in the fourth, fifth, and sixth grade classes.

The table in figure 1 points out that the lower 45 percent of the classes out-distanced the upper 55 percent by one year and two months in the Hewlett-Packard Program. In comparing the gains on the Iowa Test of Basic Skills, Math Sub-Test one finds that the lower 45 percent gained three months more than the upper 55 percent. From the standpoint of how much was learned, it should be noted that the lower group learned 30 percent more than the upper group. (See Figure 2.)

(Figure 2.)

A COMPARISON OF THE LOWER 45% TO THE UPPER 55%

(Iowa Test of Basic Skills, Math Sub-Test)



These gains in math skills, extreme though they may seem, are within the reach of any classroom teacher. The Hewlett-Packard Math Program does not supplant the teacher, but does strengthen concepts through drill application. It is comparatively reasonable in cost when the hours of concentrated study and the results are considered. The fee for the use of the Hewlett-Packard Program at the Research Triangle Park is $150.00 per month. A computer terminal may be purchased for $1,100.00 or less. Additional fees for the use of telephone lines must be added. Log Cabin School is two hundre and fifty miles from the Research Triangle Park and requires special telephone connections. With optimum use of the computer, 7 hours per day, 180 days per year, the total cost results in $3.00 to $5.00 per hour of instruction. The cost of subsequent years of operation is less, because the terminal has already been purchased. (See Figure 3.)

(Figure 3.)

Hewlett-Packard Math Program Cost Breakdown - 9 Months

C.A.I. Software Rental - $150.00 per month	$1,350.00
Terminal (one time purchase)	1,100.00
Telephone Costs (depends on your location)	
TOTAL COSTS	$2,450.00 +

No teacher or aide could provide the hours of concentrated study for each student that Computer-Assisted Instruction can make available.

The school systems of both the cities of Memphis, Tennessee, and Chicago, Illinois, which have been visited by Teacher Corps staff, have been using C.A.I. programs with great success for over seven years. Both school systems use Title I funds for their C.A.I. programs. In Memphis, those children who

were one and one half years to two years below grade level were given C.A.I. instruction. After one year with C.A.I. these students had learned and retained enough math to raise them above the qualifications set for the Title I program.

The city of Chicago has had 10,000 students each year on C.A.I. programs and they have obtained similar results. During this school year, 1977-78, they have increased the number of students using the C.A.I. programs to 20,000.

The Log Cabin School experiment has been most rewarding to both students and teachers. It has increased grade level scores in math beyond expectation and has provided a means of maintaining interest and accomplishment for a large number of students. Computer-Assisted Instruction has become a worthwhile reality for children who have had little hope for success in the past.

Mr. Clarence Hubbell, Principal of Log Cabin Elementary School (Rt. 1, Whittier, North Carolina), Miss Doris Pennington, and Mrs. Pat Fore, who were the teachers involved in the program, concur in the findings and join the Teacher Corps staff in stating that this has been one successful way to meet the needs of these children.

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COST OF COMPUTER TERMINAL AT LOG CABIN SCHOOL - September, 1976 - August, 1977

Month	Multiplex	Telpak	Southern Bell Phone	Western Carolina Phone
Sept., 1976	$138.25	$21.00	$87.75 (installation) 75.11	$494.25 (installation) 88.90
Oct., 1976	225.00	42.00	162.86	88.90
Nov., 1976	225.00	42.00	107.28	88.90
Dec., 1976	225.00	42.00	107.28	88.90
Jan., 1977	225.00	42.00	106.97	88.90
Feb., 1977	225.00	42.00	106.97	88.90
March, 1977	225.00	42.00	106.97	88.90
April, 1977	225.00	42.00	106.97	88.90
May, 1977	225.00	42.00	106.97	88.90
June, 1977	127.88	42.00	53.50 (half rate)	88.90
July, 1977		42.00	53.50	
Aug.,1977		42.00	106.97	
	$2,066.13	$483.00	$1,288.00	$1,383.25

Multiplex - $225.00
Telpak 42.00
Southern Bell 107.00
Western Phone 88.90
$462.90 x 10 months = 4,629.00 + installation charges